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Indian Standard (Reaffirmed 1999)

GRAPHICAL SYMBOLS FOR USE ON DETAILED MAPS, PLANS AND GEOLOGICAL CROSS SECTIONS

PART III REPRESENTATION OF MAGMATIC ROCKS

1. Scope — Lays down symbols and ornaments for the representation of magmatic rocks on detailed maps, plans and geological cross sections.

2. Groups

a) Main types, and
b) Varia.

2.1 The symbols of two groups derived from a logical system, are reproduced in Tables 1 and 2 which may be completed easily in case of need.

3. Main Types

3.1 *Basic Symbols* — Table 1 indicates the basic symbols for the main types comprising of plutonic and volcanic rocks.

3.1.1 Column 1 indicates the symbols for the plutonic rocks. The plutonic rocks have been subdivided into eight groups, according to their silica content. For each of the groups 1 to 6 two basic symbols have been indicated against col 1, under the letters (a) and (b) while only one basic symbol has been assigned to group 7 and 8. Two basic symbols have been kept for the first six groups to allow, on the same sheet, the representation of rocks of similar petrographic composition but of the different age.

3.1.1.1 For more detailed sub-division of the main types, the symbols shall be slightly modified (*see* col 2 for groups 3, 4, 6 and 7). For further differentiation, suitable additional symbols shall be used.

3.1.2 The dyke rocks which correspond to plutonic rocks shall be represented by the same symbols as the plutonic rocks placed between the two lines delimiting the dyke. Special symbols for these dyke rocks are unnecessary.

3.1.2.1 Sill rocks shall be represented in the same way.

3.1.3 Column 3 indicates the symbols for volcanic rocks. The subdivision is similar to that of the plutonic rocks.

3.2 *Grain Size* — A distinction in the grain size of rocks shall be indicated by the smaller or greater size of the individual symbols. For example, coarse-grained syenite and fine-grained syenite shall be indicated as shown in Fig. 1 and 2 respectively.

3.2.1 To represent porphyritic texture the ordinary symbol shall be replaced at intervals by a larger symbol (*see* Fig. 3).

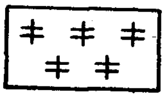

FIG. 1 COARSE-GRAINED SYENITE

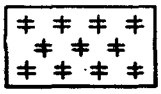

FIG. 2 FINE-GRAINED SYENITE

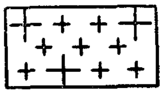

FIG. 3 PORPHYRITIC GRANITE OR GRANITE PORPHYRY

3.3 *Individual Symbols*

3.3.1 *Plutonic and volcanic rocks* — The symbols shall be derived from a cross + or a letter Y (*see* Fig. 4) for representing plutonic rocks and from a right angle placed on its point ∨ (*see* Fig. 5) for representing volcanic rocks.

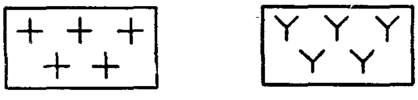

FIG. 4 PLUTONIC ROCKS

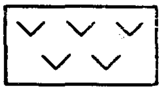

FIG. 5 VOLCANIC ROCKS

Mining Sectional Committee, EDC 50; Basic Mining Standards Subcommittee, EDC 50:5 [Ref: Doc: EDC 50 (2420)]

Adopted 29 April 1976

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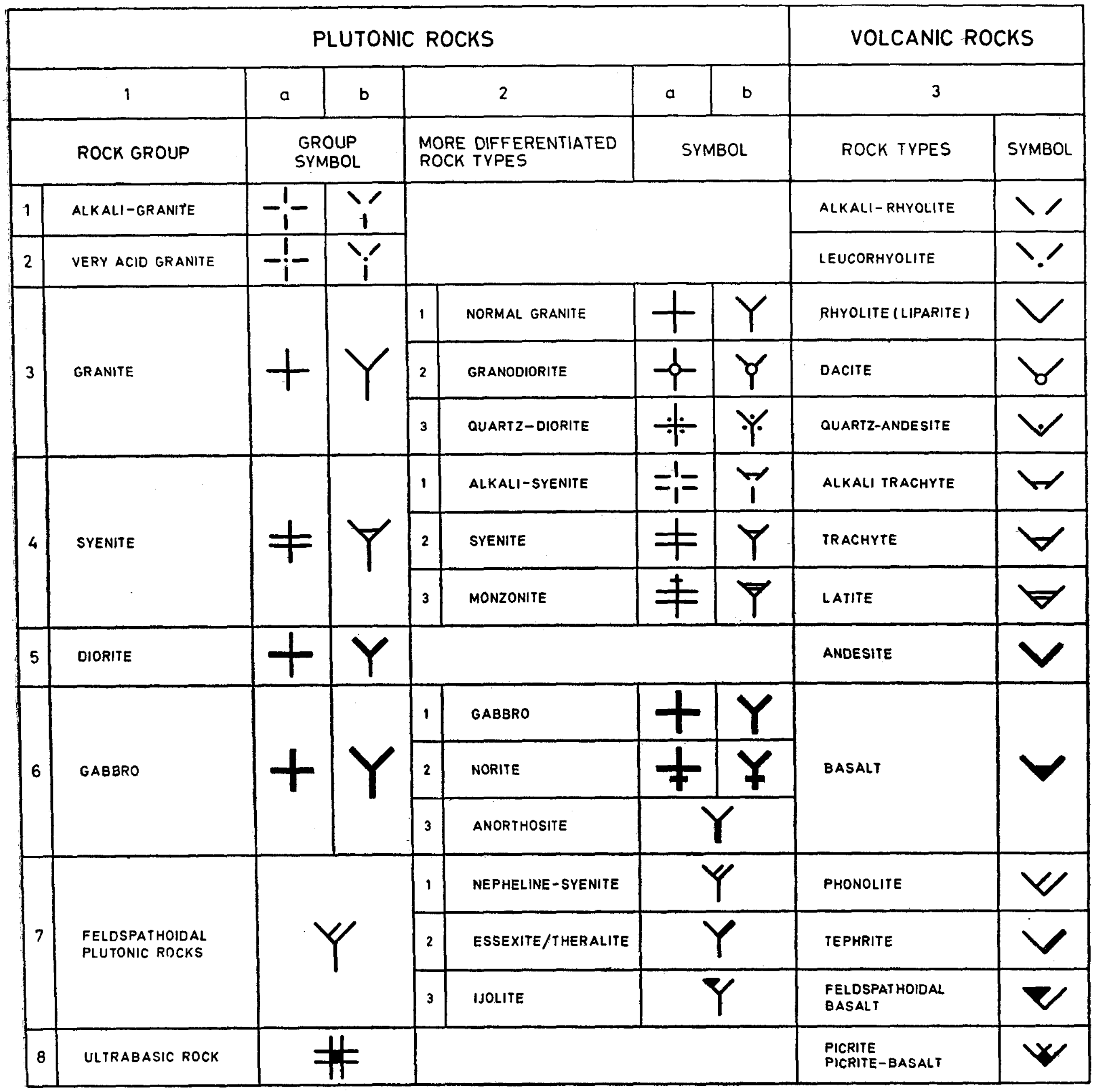
3.3.1.1 The basic symbols of plutonic and volcanic rocks are varied in the same way according to the silica content of the rocks (*see* Table 1).

TABLE 1 SYMBOLS FOR MAIN TYPES

(*Clauses* 3.1, 3.3.1.1 *and* 4)



PLUTONIC ROCKS								VOLCANIC ROCKS	
1		a	b	2		a	b	3	
ROCK GROUP		GROUP SYMBOL		MORE DIFFERENTIATED ROCK TYPES		SYMBOL		ROCK TYPES	SYMBOL
1	ALKALI-GRANITE	-¦-	\¦/					ALKALI-RHYOLITE	\ /
2	VERY ACID GRANITE	-⁞-	\:/					LEUCORHYOLITE	\./
3	GRANITE	+	Y	1	NORMAL GRANITE	+	Y	RHYOLITE (LIPARITE)	∨
				2	GRANODIORITE	⌖	Yo	DACITE	∨o
				3	QUARTZ-DIORITE	+⁚	Y⁚	QUARTZ-ANDESITE	∨·
4	SYENITE	╪	Ɏ	1	ALKALI-SYENITE	=¦=	Ɏ¦	ALKALI TRACHYTE	\-/
				2	SYENITE	╪	Ɏ	TRACHYTE	▽
				3	MONZONITE	‡	Ȳ	LATITE	⊽
5	DIORITE	╋	𝐘					ANDESITE	𝐕
6	GABBRO	✚	𝐘	1	GABBRO	✚	𝐘	BASALT	▼
				2	NORITE	☨	Ұ		
				3	ANORTHOSITE	Y			
7	FELDSPATHOIDAL PLUTONIC ROCKS	Y/		1	NEPHELINE-SYENITE	Y/		PHONOLITE	\//
				2	ESSEXITE/THERALITE	𝐘		TEPHRITE	✓
				3	IJOLITE	▼Y		FELDSPATHOIDAL BASALT	▼/
8	ULTRABASIC ROCK	⋕						PICRITE PICRITE-BASALT	▼✗

3.3.2 *Alkaline rocks* — To represent alkaline rocks, with the exception of feldspathoidal rocks, open space shall always be left at the point of intersection of the lines (*see* Fig. 6 and 7).

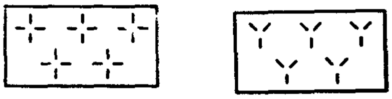


FIG. 6 ALKALI GRANITE

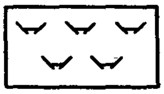


FIG. 7 ALKALI TRACHYTE

3.3.3 *Very acid rocks* — To represent the very acid rocks, a point shall be placed at the centre of the symbol, by interrupting the lines around the point of intersection. This point shall indicate the high content of quartz (*see* Fig. 8).

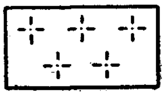


FIG. 8 HIGHLY ACID GRANITE

3.3.4 *Feldspathoidal rocks* — The symbols shall always be asymmetrical (*see* Fig. 9).

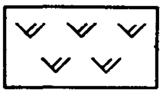


FIG. 9 PHONOLITE

3.3.5 *Basic rocks* — To represent basic rocks the lines shall be thickened with increasing basicity of the rocks so that the darker appearance of the rock is reflected in the symbol. The ratio of the width of thin and thick lines shall be 1 : 3 (*see* Fig. 10, 11 and 12).

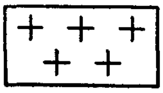


FIG. 10 GRANITE

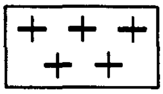


FIG. 11 DIORITE

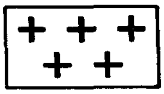


FIG. 12 GABBRO

3.3.6 *Ultrabasic rocks* — To represent ultrabasic rocks, the length of lines shall be increased or decreased in comparison with the black square (*see* Fig. 13).

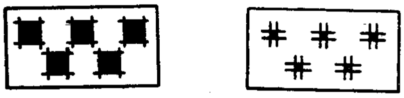


FIG. 13 ULTRABASITES

3.3.7 For distinguishing paleovolcanic rocks from neovolcanic rocks, the symbol for the former shall be underlined (*see* Fig. 14 and 15).

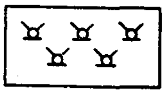


FIG. 14 SILICIOUS PORPHYRITE (ANCIENT)

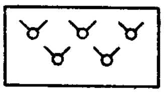


FIG. 15 DACITE (RECENT)

4. Varia — The symbols for ' varia ' (*see* Table 2) are complementary to symbols for ' Main Types ' (*see* Table 1). It contains symbols for magmatic rocks which are hardly suitable for the system used for main types.

4.1 *Groups of Varia* — Table 2 has been sub-divided into four different groups to indicate following types of magmatic rocks:

a) Tuffs,

b) Lavas and volcanic glasses,

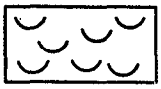
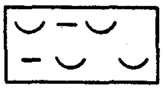
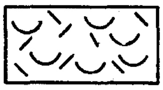
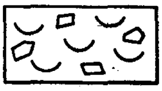
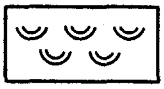
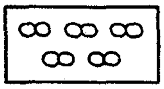
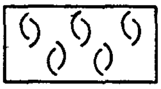
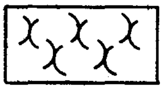
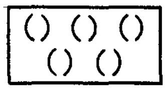
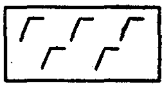
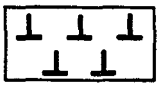
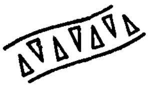
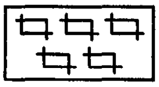
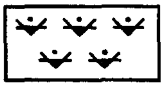
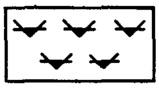
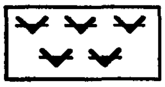
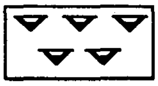
c) Dyke rocks, and

d) Miscellaneous volcanic rocks.

4.2 *Tuffs* — The group of tuffs shall be represented by symbol No. 101 to 105 (*see* Table 2).

TABLE 2 SYMBOLS FOR VARIA

(*Clauses* 4 *and* 4.2)

TUFFS					
101	UNCONSOLIDATED TUFF (VOLCANIC ASH)		102	TUFFITE (CONSOLIDATED)	
103	CRYSTAL TUFF (UNCONSOLIDATED)		104	VOLCANIC BRECCIA (UNCONSOLIDATED)	
105	IGNIMBRITE		106		
LAVAS AND VOLCANIC GLASSES					
201	PUMICEOUS LAVA		202	OBSIDIAN	
203	PERLITE		204	PUMICE	
DYKE ROCKS					
301	PEGMATITE		302	LAMPROPHYRE	
303	QUARTZ VEIN		304	CARBONATITE	
MISCELLANEOUS VOLCANIC ROCKS					
401	QUARTZ-KERATOPHYRE		402	KERATOPHYRE	
403	DIABASE		404	SPILITIC VOLCANIC ROCKS	

4.2.1 *Tuff* (*symbol No. 101*) — The basic symbols for tuff shall be arranged as follows in the ornament in accordance with the texture of the rock:

a) Irregularly for unconsolidated tuff (*see* Fig. 16),

b) In rows for stratified tuff (*see* Fig. 17), and

c) In alternating rows for consolidated tuff (*see* Fig. 18).

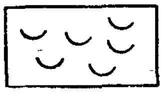


FIG. 16 UNCONSOLIDATED TUFF

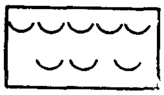


FIG. 17 STRATIFIED TUFF

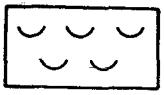


FIG. 18 CONSOLIDATED TUFF

4.2.1.1 To represent acid tuffs thin lines shall be used while as to indicate basic tuffs, thick lines shall be used (*see* Fig. 19 and 20).

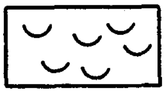


FIG. 19 ACID TUFF

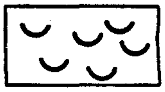


FIG. 20 BASIC TUFF

4.2.1.2 In case of discernible volcanic rock the rock symbol shall be inserted here and there (*see* Fig. 21).

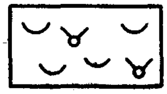


FIG. 21 DACITIC TUFF (UNCONSOLIDATED)

4.2.2 *Tuffite* (*symbol No. 102*) — To represent tuffite with predominating sand a larger number of points representing sand shall be inserted in the symbol, and to indicate tuffite with predominating clay the number of dashes representing clay shall be increased (*see* Fig. 22 and 23).

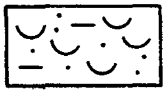


FIG. 22 SANDY TUFFITE (UNCONSOLIDATED)

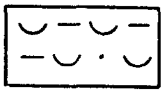


FIG. 23 ARGILLACEOUS (MUDDY) TUFFITE (CONSOLIDATED)

4.2.2.1 The symbols for volcanic admixture shall be added to represent tuff or tuffite with blocks (*see* Fig. 24 and 25).

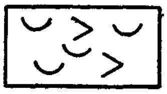


FIG. 24 BLOCK TUFF (UNCONSOLIDATED)

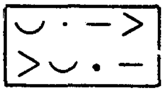


FIG. 25 BLOCK TUFFITE (CONSOLIDATED)

4.2.3 *Crystal tuff* (*symbol No. 103*) — To represent crystal tuff the symbols for tuffs and feldspar shall be combined. If the porphyritic crystal component is not feldspar, the symbol for feldspar shall be replaced by that of the appropriate mineral.

4.2.4 *Volcanic breccia* (*symbol No. 104*) — To represent volcanic breccia the basic symbols for tuffs and detritus shall be combined.

4.2.5 *Ignimbrite* (*symbol No. 105*) — For ignimbrite, which can be regarded as a tuff in the wider sence of the word, a symbol in the form of a double arc opening upwards shall be used.

4.3 *Lavas and Volcanic Glasses* — The group of lavas and volcanic glasses shall be represented by symbol No. 201 to 204.

4.3.1 *Pumiceous lava* (*symbol No. 201*) — The pumiceous lava shall be represented by the figure 8 placed horizontally. This symbol has been chosen to recall the bubbles in the lava.

4.3.2 *Obsidian, perlite, pumice* (*symbol No. 202 to 204*) — The symbols for obsidian, perlite and pumice shall be composed of two elements of identical form combined together differently.

4.4 *Dyke Rocks* — The group of dyke rocks shall be represented by symbol No. 301 to 304.

4.4.1 *Pegmatite* (*symbol No. 301*) — To represent acid and basic pegmatites, thin and thick lines respectively shall be used (*see* Fig. 26 and 27).

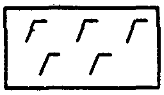


FIG. 26 ACID PEGMATITE

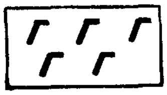


FIG. 27 BASIC PEGMATITE

4.4.2 *Lamprophyre (symbol No. 302)* — The symbol for lamprophyre, derived from a cross, shall be printed in thick lines because of basicity of the rocks.

4.4.2.1 For representing narrow dykes, the basic symbols shall be staggered, as shown in Fig. 28.

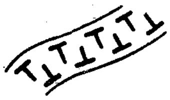


FIG. 28 LAMPROPHYRE DYKE

4.4.3 *Quartz vein (symbol No. 303)* — To represent a quartz vein, the wedge symbols for quartz shall be placed in opposition and left blank to convey the acidity of the rock.

4.4.4 *Carbonatite (symbol No. 304)* — The symbol for carbonatites shall compose of a small square to represent limestone and a cross to recall the magmatic origin.

4.5 *Miscellaneous Volcanic Rocks* — This group of rocks shall be represented by symbol No. 401 to 404.

4.5.1 To characterize these volcanic rocks, a horizontal dash shall be added to the normal volcanic rock symbol.

4.5.2 If one of these rocks occurs in dyke form, a vertical line shall be added to the horizontal line (*see* Fig. 29).

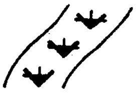


FIG. 29 DIABASE DYKE

EXPLANATORY NOTE

This standard is in conformity with ISO 710/III-1974 ' Graphical symbols for use on detailed maps, plans and geological cross sections, Part III Representation of magmatic rocks ' issued by the International Organization for Standardization.

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